SKILLED

in the fabrication of **STEEL**
PURE METALS
and
ALLOY MATERIALS

NOOTER
ST. LOUIS

50 YEARS OF SERVICE

PIONEERS IN

NO WEAK LINKS

THE WHOLE process of metal fabrication can be likened to the links of a chain. A single weakness can be responsible for the failure of the entire assembly to withstand corrosion or pressure. In fifty years of designing and fabricating pressure vessels and kindred equipment, the John Nooter Boiler Works Company has learned the "tricks of the trade" which insure against a single weak link in the Nooter chain of fabrication.

The links of this chain are comprised of ENGINEERS AND LAYOUT MEN, all of whom have had years of shop experience, are technically trained, and translate blueprints into action. By clever computation they get the most out of every piece of material. Their knowledge means real savings to you when working with metals that may cost from 3c to $10.00 per pound!

NOOTER SHOP MECHANICS are experts with the tools of the trade . . . men who can form heavy sheets of metal to their will . . .

JOHN NOOTER

1400 SOUTH SECOND ST.

1078

NOOTER ST. LOUIS

FIFTY YEARS OF SERVICE

WELDED CONSTRUCTION

50 YEARS OF SERVICE

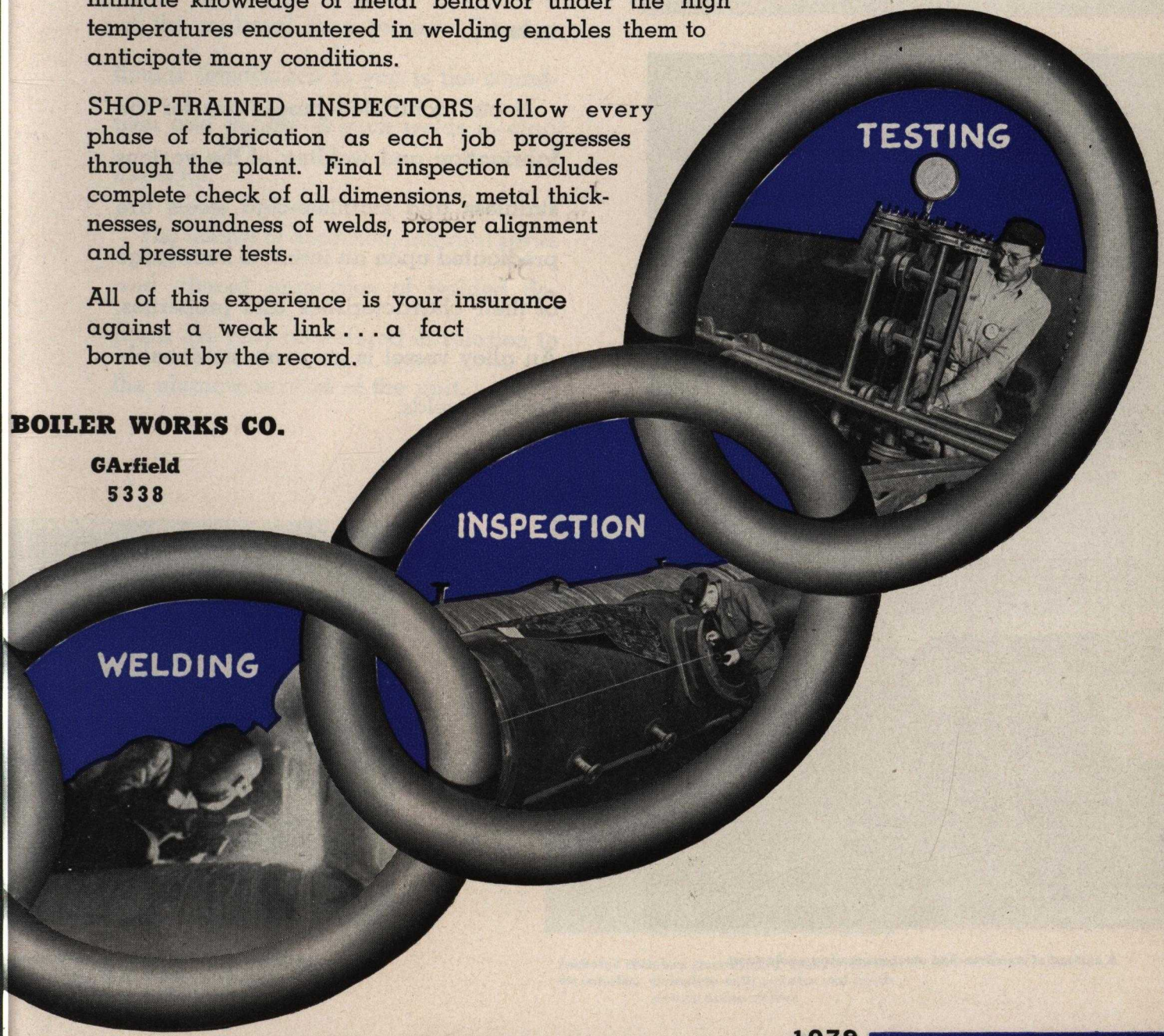
IN THIS CHAIN!

men who can anticipate distortion, stresses and shrinkage . . . men who can skillfully operate all the intricate machines used in metal fabrication. They control the complex job of assembly . . . see that every part of the finished product is exactly fitted . . . and that the completed unit meets the exact requirements of the blueprint.

WELDING OPERATORS, qualified under approved procedures, are masters of the various welding processes. Their intimate knowledge of metal behavior under the high temperatures encountered in welding enables them to anticipate many conditions.

SHOP-TRAINED INSPECTORS follow every phase of fabrication as each job progresses through the plant. Final inspection includes complete check of all dimensions, metal thicknesses, soundness of welds, proper alignment and pressure tests.

All of this experience is your insurance against a weak link . . . a fact borne out by the record.



BOILER WORKS CO.

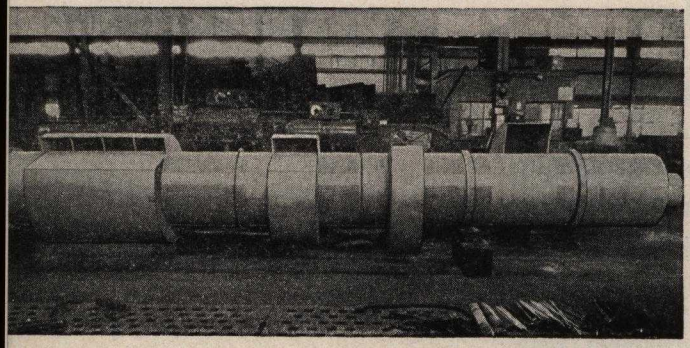
GArfield 5338

1079

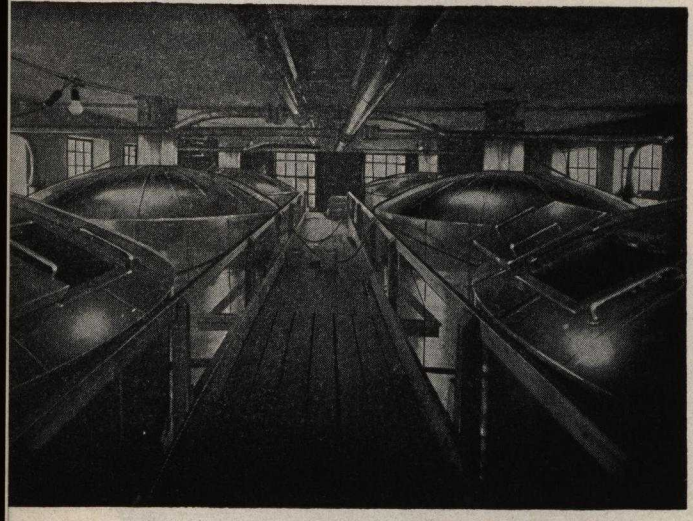
TO AMERICAN INDUSTRY

NOOTER ST. LOUIS

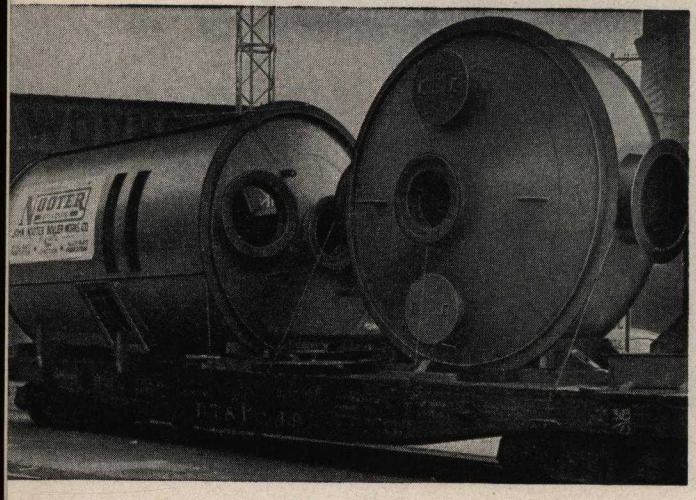
STAINLESS



Intricate pickling device fabricated of stainless steel for the munitions industry.



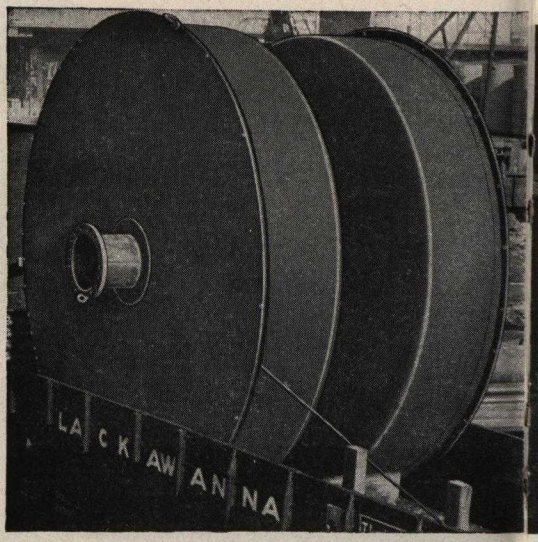
Six stainless-clad steel storage tanks polished on interior to sanitary finish.



A carload of stainless-clad steel processing equipment.

Stainless steels cover a large number of different compositions and are one of the most versatile group of alloys in industry.

Nooter controlled procedures for the fabrication and welding of the various stainless and stainless-clad steels are predicated upon an intimate knowledge of their characteristics and properties. An alloy vessel is no more serviceable than its welds.



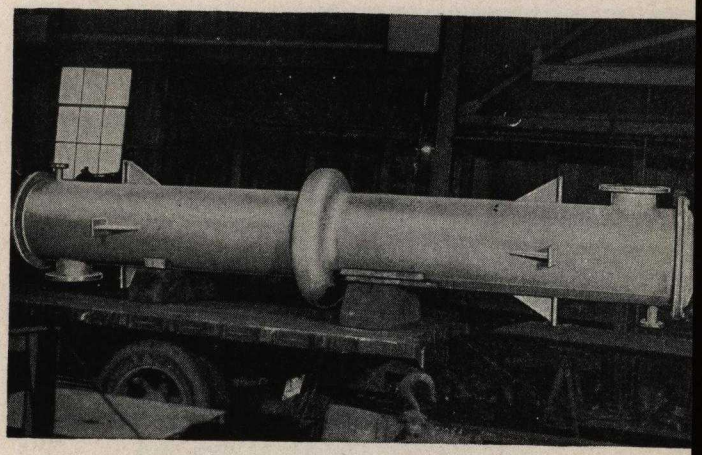
12 feet 0 inches diameter stainless steel filters.

STAINLESS STEEL

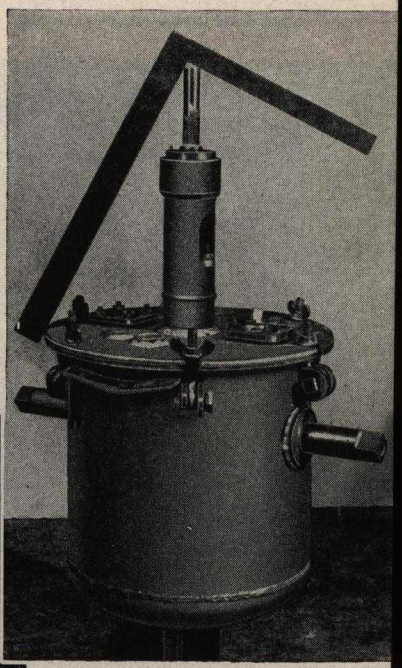
STEEL

Our fabrication methods assure you of uninterrupted corrosion-resistant surfaces with welds of the same properties as the material they secure. Of particular importance to you is the soundness and quality of such welds in clad material.

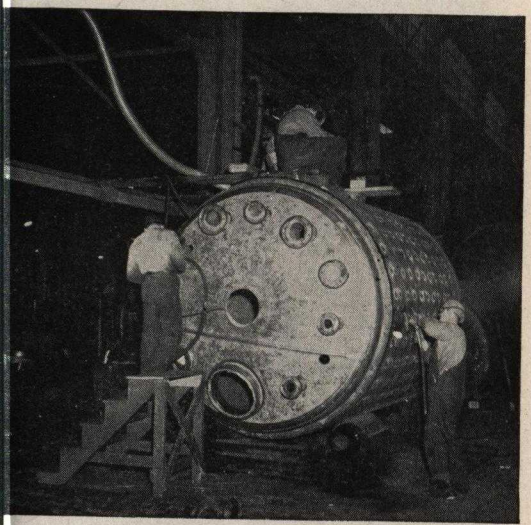
The factors of distortion, internal stress and altered properties of welded deposits are fully considered in relation to the ultimate service of the unit.



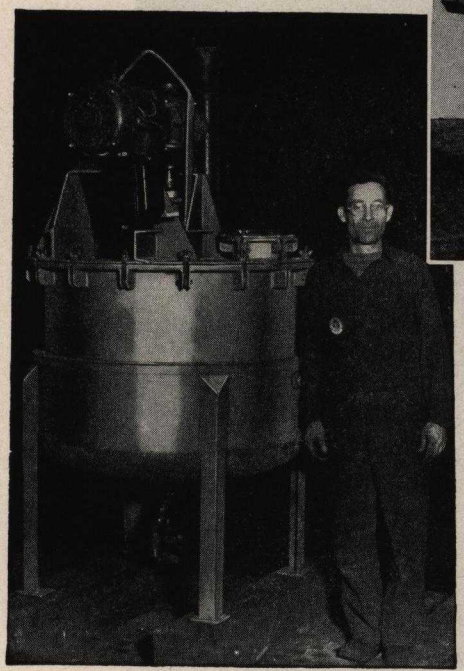
2 feet 0 inches diameter by 15 feet 0 inches long Type 317 stainless condenser with stainless steel tubes.



Above—10 gallon jacketed Type 304 stainless steel kettle with steam outlet and inlet in trunions.

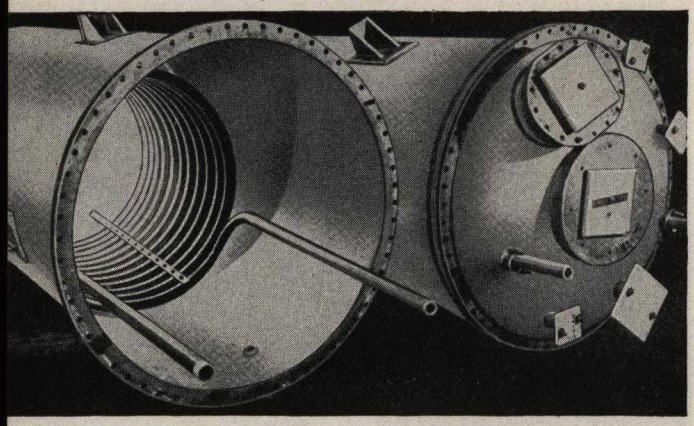


6 feet diameter stainless steel pressure vessel with steel jacket. Note welded stay-pads to channel steam flow and withstand high pressure.

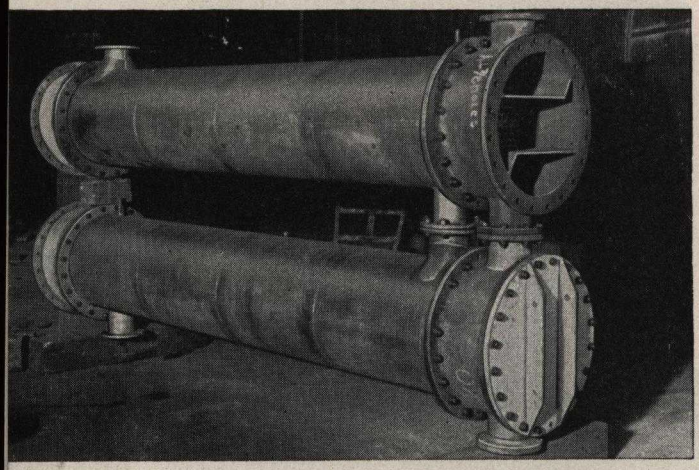


Jacketed stainless steel mixing tank, polished on interior. Complete with agitator and quick acting dump valve.

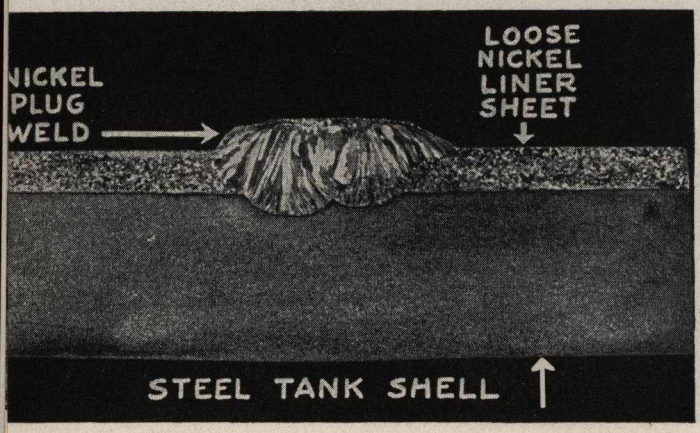
NOOTER ST. LOUIS



Two 5 feet 0 inches by 10 feet 0 inches Monel tanks with Monel coils.



Twin tubular unit made of Hastelloy alloy throughout.



Demonstrates Nooter-developed technique for attaching Nickel liner sheets to the interiors of steel vessels by plug and butt welding with pure Nickel electrodes.

NICKEL
and NICKEL BASE ALLOYS

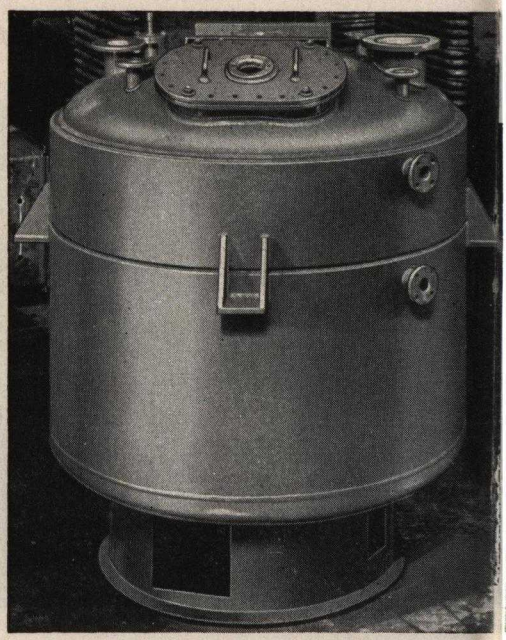
This group of alloys embraces Nickel, Monel, Inconel, the Hastelloy alloys, and Illium. They enjoy wide usage in the processing industries for resistance to corrosion, wear and product contamination.

Nickel, Monel and Inconel are unusually resistant to corrosion by a great many of the acid salts, particularly lye and sodium chloride.

The four nickel base Hastelloy alloys are designed for unusually high resistance to the corrosion of a variety of media. This is particularly true of hot hydrochloric acid, hot sulphuric acid and wet chlorine.

Again particular care must be used in their fabrication to eliminate embrittlement and work-hardening. Nooter has mastered the intricacies of forming these materials without detracting from their desirable properties.

Nooter fabrication procedures closely control the working of these materials whether they be in the solid or clad forms, as well as in the installation of light gauge sheet metal liners.



One 4 feet 6 inches I. D. by 3 feet 3 inches Nickel clad, jacketed tank.

COPPER
and COPPER ALLOYS

Copper, Silicon Bronze alloys, and Cupro-nickel will resist many corrosive solutions and compounds.

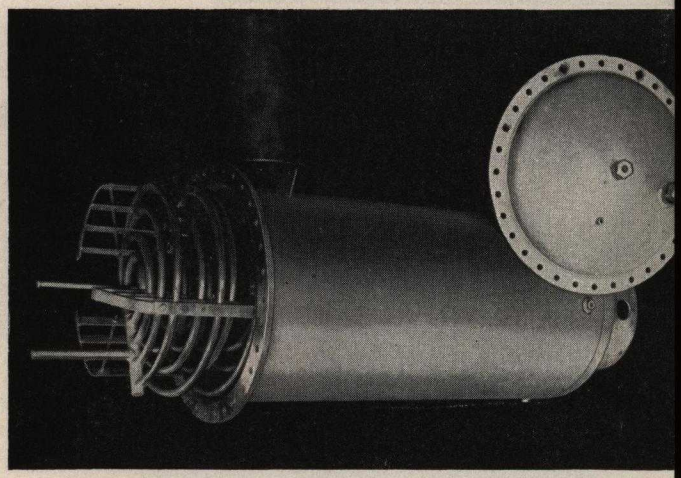
The presence of various oxidizing agents in the corrosive media often alters the resistance properties of these metals. In exactly the same way, the quality of weld metal used in the fabrication of equipment from these metals may detract from their resistance properties.

However, procedures developed by Nooter control the quality of welded deposits so that their corrosion resistant properties match those of the original material.

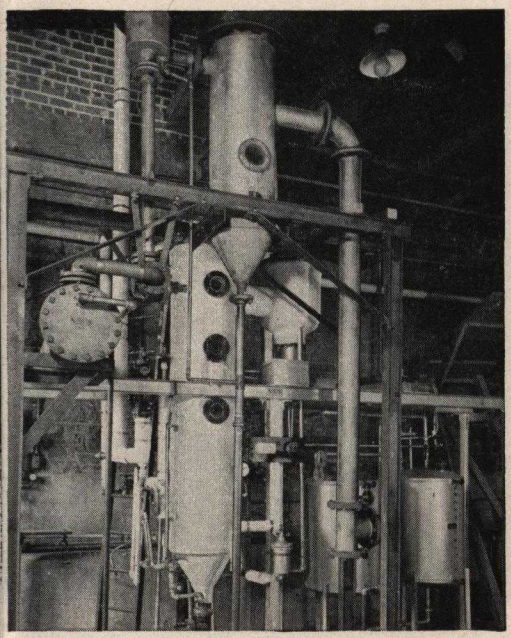
The type of flux used, the sequence of beads, and the general pattern of welding, all contribute to the relief of pent-up stresses. The procedures followed in bending, rolling, drilling, and shearing, all have a bearing on the resistant properties of stressed areas.

Nooter has mastered techniques that insure maximum resistance against strains and pressures . . . these techniques are another assurance of high quality in Nooter-fabricated products.

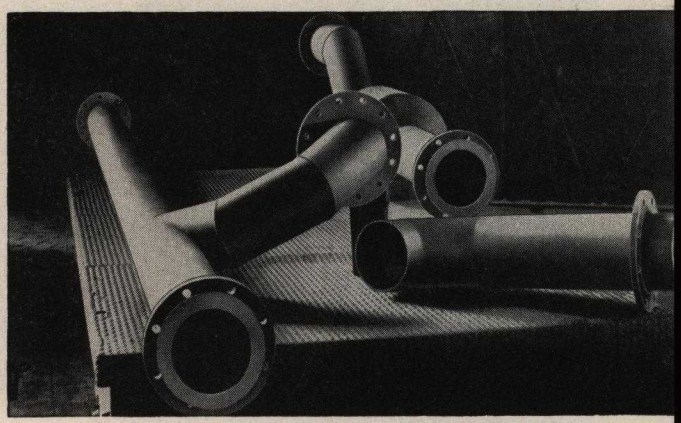
Copper varnish kettle with steel reinforcing bands.



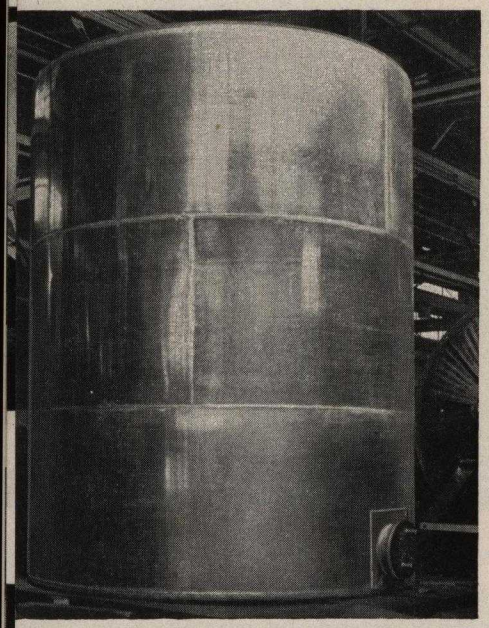
4 feet diameter Cupro-nickel salt water treating equipment complete with expansion coil.



Silicon bronze calandria unit, flash chamber, etc., used in connection with operation of cyclotron.



14 inch diameter silicon bronze piping for refinery service, welded by the carbon arc process. Back-up flanges are of steel.



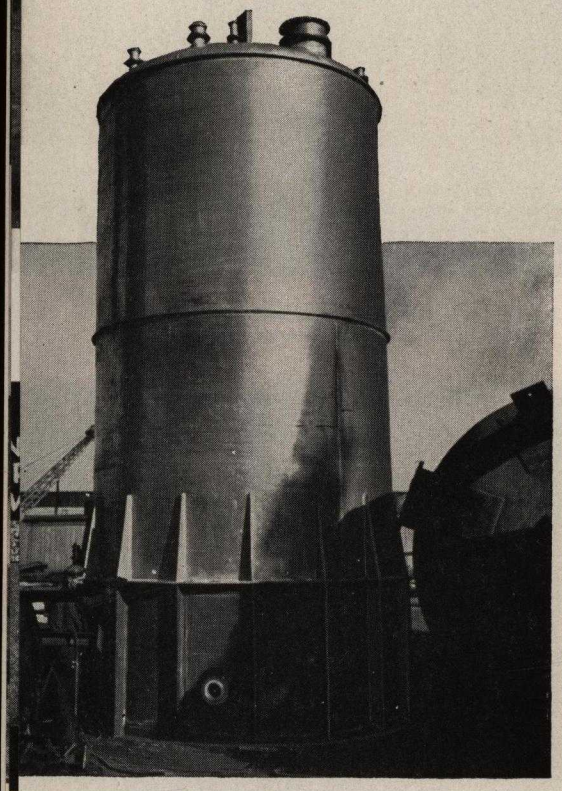
0 feet diameter, ½ inch thick aluminum tank for chemical processing.

ALUMINUM

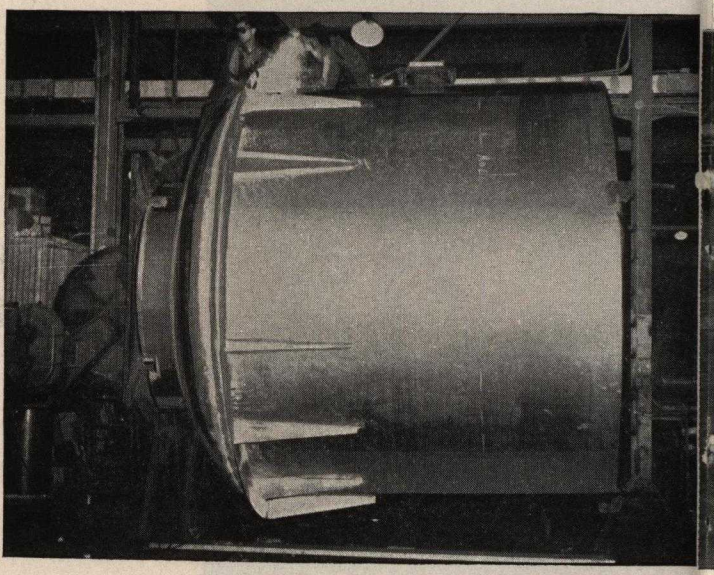
Light weight, high heat conductivity and chemical stability combine to make aluminum one of the world's most popular industrial metals. It is especially useful in the chemical, refining and food processing industries.

Nooter has gained an intimate knowledge of the metal's properties through the fabrication of processing equipment. Long experience in this work has dictated sound fabricating procedures.

The atomic hydrogen, oxy-acetylene and shielded arc methods are used in welding aluminum, and the method used depends on type of structure, plate thickness, and ultimate service for which the vessel is intended. Often several types of welding procedure are used on a single unit.



10 feet diameter by 15 feet high chemical storage tank fabricated by welding of ⅜ inch thick aluminum.



Fabricating lower section of tank at left while mounted on welding positioner.

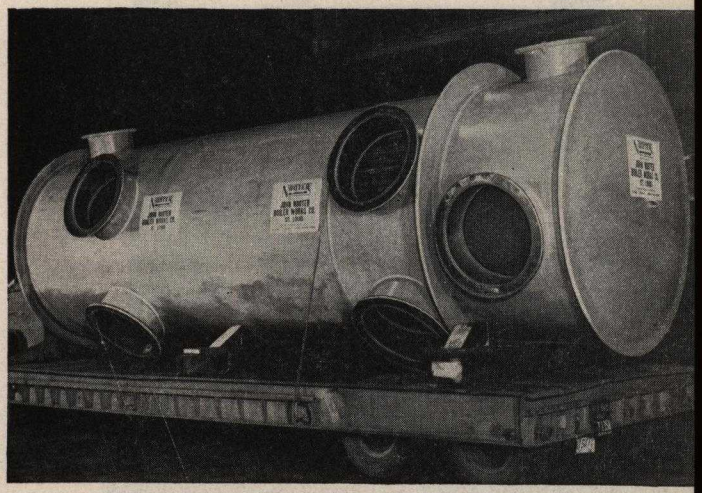
STEEL

From the early days of riveted construction, through fifty years of expansion and improvement, the name of Nooter has been associated with superior steel fabrication. Today, with manual shielded arc, automatic and oxy-acetylene welding, the Nooter organization continues to be a leader in the field.

We are fully qualified to fabricate under all existing codes on all types of steel—tank, flange quality, firebox quality or low alloy. We are also qualified in the field of wrought iron construction.

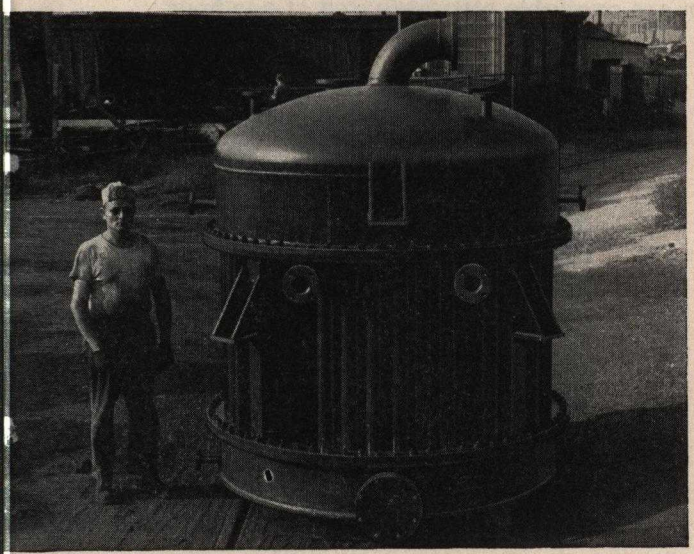
The controlled procedures used in handling the more expensive alloys, apply as well to the construction of steel equipment.

Nooter specializes in the manufacture of intricate assemblies, whether of riveted, welded or bolted construction.

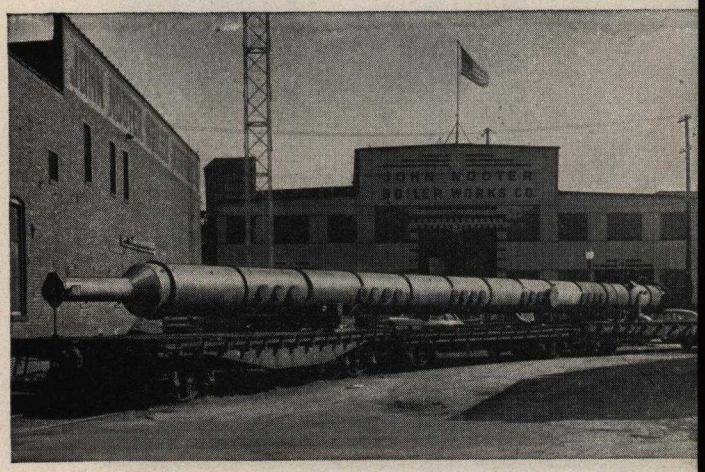


Heat exchanger 7 feet 5 inches diameter x 23 feet 6½ inches long having approximately 900 2-inch tubes.

First mass production penicillin culture tanks ever built. Shown here are five 2,500 gallon coil tanks.



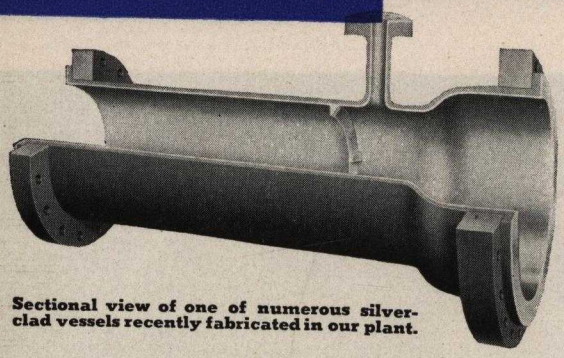
Heating unit 6 feet 6 inches diameter x 8 feet 0 inches high, containing (40) 4" diameter tubes surrounding baffled inner shell.



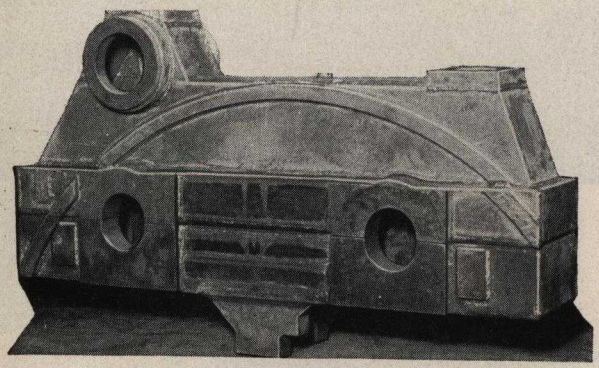
3 feet 6 inches x 110 feet high steel fractionating column loaded on three flat cars.

SPECIAL SERVICES

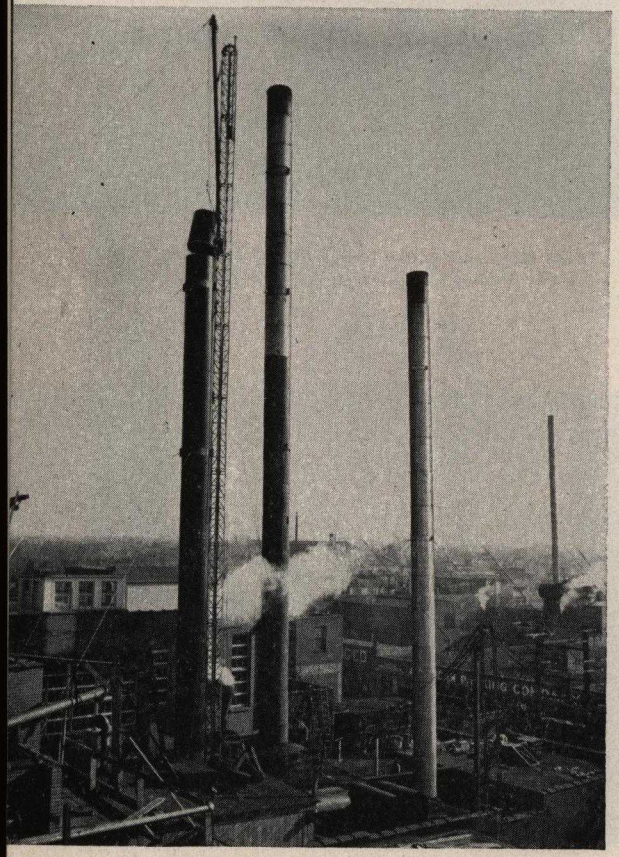
PIONEERS IN



Sectional view of one of numerous silver-clad vessels recently fabricated in our plant.



From castings to weldments, one of a large number of gear cases fabricated in the Nooter plant for a Diesel engine manufacturer.



Erecting 4 feet diameter x 110 feet high steel smoke stack fabricated in Nooter Shops of ¼ inch and 3/16 inch thick steel. Incidentally, every stack in this picture is testimony of Nooter stack fabrication and erecting ability.

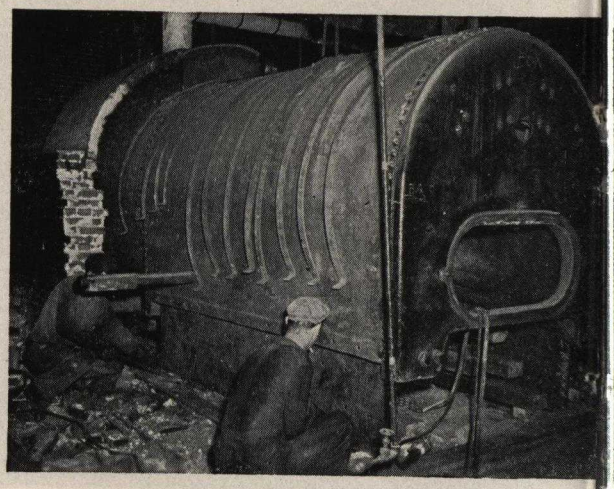
SPECIAL

Nooter offers a variety of special services that are directly connected with plate fabrication.

SUB-ASSEMBLIES AND SPECIAL EQUIPMENT for manufacturers of power transformers, Diesel engines and similiar heavy equipment, are constructed. Precise workmanship and finished appearance are assured in this type of work. Nooter offers prompt delivery on large volume contracts for special assemblies.

LEAD LINED VESSELS have long been used for handling various acids and in organic chemical processes. The bonding of the lead lining to the steel tank can be accomplished by several methods. Our expert lead burners are artisans at all—spot bonding, homogeneously lining and mechanical attachment.

A HIGHLY TRAINED FIELD CREW is always ready to serve Nooter customers. Boilermakers, certified welding operators and experienced riggers stand prepared to repair all types of steel boilers, and to erect steel stacks and tanks. Equipped with a variety of special tools, these men are available anywhere and at any hour.



Replacing corroded lower fire box on steam boiler, an innovation developed by Nooter.

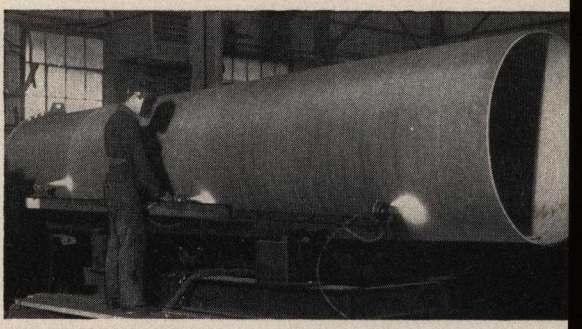
SERVICES

METALLIZING . . . for rebuilding worn bearing surfaces, journals, pump rods, press fits, packing surfaces, etc. . . . is the work of another department. Nooter's metallizers are among the most skilled and versatile in the country. Here again, procedures developed through the use of the latest equipment are applied to the spraying of metal deposits. The Metallizing Department stands ready to apply metallic linings to existing equipment, to perform mechanical repairs in the field or in the Nooter shop.

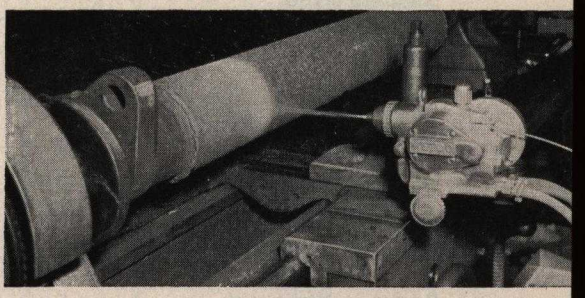
Other available services include angle rolling, difficult forming and pressing, heavy machining, plate rolling and bending, flame cutting, punching and shearing, flanging, dishing, A. S. M. E. welding and hard surfacing.

In every department . . . in every phase of work . . . our most valuable asset is the experience of the Nooter employee family. It is this experience which insures unsurpassed quality in metal fabrication.

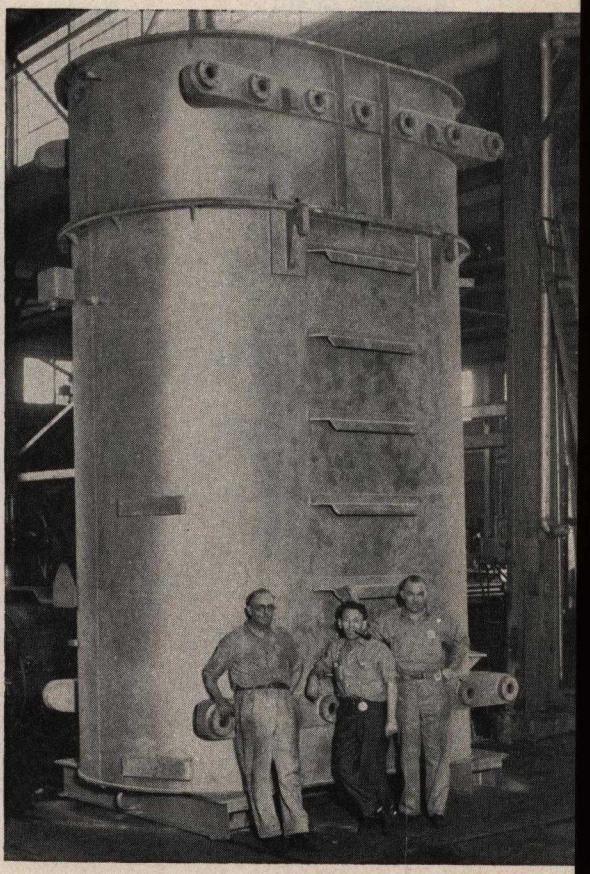
The above photograph depicts spot bonding of lead lining. The homogeneous method of lead lining, also performed in our plant, is especially desirable for vacuum service and where extremely intimate contact between the lead and steel is necessary.



The application of heat resistant coating to gasification unit by means of the metallizing process. Note multiple unit set-up.



One of many cast iron pipe line pump plungers being restored to original dimension by metallizing with stainless steel.



2800 KVA transformer tank fabricated in Nooter's shops.

The data presented in the following corrosion charts deal with the resistance values of the materials most commonly used in our plant. It must be understood that these data are shown to serve only as a general suggestion and not as a guarantee.

Very often, by virtue of the many involved ramifications of a corrosion problem, a recommendation of a metal or alloy becomes invalid due to undisclosed conditions or to variations in temperature, concentration, velocity, aeration,

SALTS

MEDIA	Concentration	Temperature °F	Aluminum	Illium	Copper	Silicon Bronze	Cupro-Nickel	Hastelloy A	Hastelloy B	Hastelloy C	Hastelloy D	Monel	Nickel	Inconel	Stainless Steel 302	Stainless Steel 316	Stainless Steel 430	Stainless Steel 410
Acetyl Chloride		Cold & Boiling	..	..	C	C	C	..	..	..	..	..	..	..	B	B	..	..
Aluminum Acetate	Saturated		B	..	A	A	A	A	A	A	A	AB	..	..	A	A	..	..
Aluminum Chloride	5%	Room	B	..	B	B	B	A	A	A	A	AB	..	..	C	C	C	C
Aluminum Fluoride	5%	Room	B	..	A	A	A	A	A	A	A	AB	..	..	C	C	C	C
Aluminum Hydroxide	Saturated		A	..	A	A	A	..	..	..	..	AB	..	..	A	A	A	..
Aluminum Oxalate			B	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	..
Aluminum Potassium Sulphate	2%	Room	..	..	A	A	A	..	..	..	..	..	..	..	A	A	A	..
Aluminum Potassium Sulphate	10%	Room	..	..	A	A	A	..	..	..	..	..	..	..	A	A	B	..
Aluminum Potassium Sulphate	10%	Boiling	..	..	AB	AB	AB	..	..	..	..	..	..	..	B	B	C	..
Aluminum Potassium Sulphate	Saturated	Boiling	..	..	AB	AB	AB	..	..	..	..	..	..	..	B	B	C	..
Aluminum Sulphate	10%	Room	B	..	A	A	A	A	A	A	A	AB	..	..	C	B	C	B
Aluminum Sulphate	10%	Boiling	..	..	AB	AB	AB	A	A	A	A	..	..	..	A	A	B	..
Aluminum Sulphate	Saturated	Room	B	..	A	A	A	A	A	A	A	..	..	..	B	A	C	B
Aluminum Sulphate	Saturated	Boiling	..	..	AB	AB	AB	..	..	..	..	..	..	..	B	A	C	B
Ammonia (Anhydrous—Dry)			A	..	A	A	A	A	A	A	A	AB	AB	A	A	A	C	A
Ammonium Alum			B	..	C	C	B	A	A	A	A	..	..	AB	A	A	AB	..
Ammonium Alum (Slightly Ammonical)			AB	..	C	C	C	A	A	A	A	..	..	AB	A	A	..	C
Ammonium Bicarbonate		Hot	A	..	C	C	C	..	..	..	..	..	..	..	A	A	..	..
Ammonium Bromide	5%	Room	BC	A	BC	BC	BC	A	A	A	A	AB	..	..	A	A	..	..
Ammonium Carbonate	All Conc.	Hot & Cold	A	A	B	B	B	A	A	A	A	..	..	AB	A	A	A	A
Ammonium Chloride	1%	Room	BC	A	BC	BC	BC	A	A	A	A	AB	..	..	*A	A	*A	AB
Ammonium Chloride	10%	Boiling	C	A	C	C	C	..	..	..	..	..	..	..	*A	*A	B	B
Ammonium Chloride	28%	Boiling	C	A	C	C	C	..	..	..	..	..	..	..	*B	*A	..	..
Ammonium Chloride	50%	Boiling	C	A	C	C	C	..	..	..	..	..	..	..	*B	*A	..	..
Ammonium Hydroxide			AB	A	C	C	C	A	A	A	A	..	..	A	A	A	A	A
Ammonium Monosulphate			C	..	B	B	B	A	A	A	A	AB	..	..	A	A	..	..
Ammonium Nitrate	5%	Room	A	..	BC	BC	BC	C	C	A	C	..	..	AB	A	A	A	A
Ammonium Oxalate	5%	Room	A	..	B	B	B	C	C	A	C	AB	..	..	A	A	A	A
Ammonium Persulphate	5%	Room	B	..	B	B	B	C	C	A	C	..	..	AB	A	A	A	..
Ammonium Phosphate	5%	Room	A	..	B	B	B	A	A	A	A	AB	..	..	A	A	A	A
Ammonium Sulphate	1% to 5% Agitated, Aerated	Room	A	..	B	B	B	A	A	A	A	AB	..	..	A	A	A	..
Ammonium Sulphate	10%	Boiling	B	..	B	B	B	A	A	A	A	AB	..	..	A	A	A	B
Ammonium Sulphate	Saturated	Boiling	B	..	B	B	B	A	B	A	A	AB	..	..	*B	*A	..	..
Ammonium Sulphite	Saturated	Cold & Boiling	..	A	C	C	C	..	..	..	..	..	..	..	*B	*A	..	..
Amyl Acetate			A	..	A	A	A	A	A	A	A	AB	AB	AB	A	A	..	..
Amyl Chloride			BC	..	A	A	A	A	A	A	A	..	AB	..	..	..	..	..
Aniline Hydrochloride	5%	Room	C	..	B	B	B	A	A	A	A	..	AB	..	C	C	C	..
Antimony Trichloride		Room		..	A	A	A	..	..	..	..	..	..	..	C	C	C	..
Barium Carbonate		Room	BC	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Barium Chloride	5% to Sat.	Room	C	..	B	B	B	A	A	A	A	AB	..	..	A	A	*A	B
Barium Hydrate	Aqueous Sol.	Hot	C	..	BC	BC	BC	..	..	..	..	AB	..	..	*B	*A	..	..
Barium Nitrate	Aqueous Sol.	Hot	C	..	A	A	A	A	A	A	A	AB	AB	AB	A	A	A	A
Barium Sulphate			..	..	BC	BC	BC	..	..	..	..	..	..	AB	A	A	..	..
Butyl Acetate		Room	A	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	..
Calcium Carbonate			A	..	A	A	A	A	A	A	A	A	..	..	A	A	..	..
Calcium Chlorate	Dilute	Room	A	..	A	A	A	A	A	A	A	A	..	..	A	A	A	A
Calcium Chloride	Dil. or Conc.	Hot or Cold	..	..	AB	AB	AB	..	..	..	..	..	..	..	A	A	..	..
Calcium Hydroxide	10% to 20%	Room	B	..	A	A	A	A	A	A	A	AB	..	..	*B	*A	C	..
Calcium Hydroxide	50%	Boiling	C	..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Calcium Hypochlorite	2%	Boiling	C	..	A	A	A	A	A	A	A	A	A	A	C	B	..	..
Calcium Sulphate	Saturated	Room	C	B	C	C	B	C	C	A	C	C	C	C	*B	*A	*B	..
Carbon Bisulphide		Room		..	A	A	A	..	..	..	..	..	..	..	A	A	A	..
Carbon Tetrachloride	Pure	Room	A	..	A	A	A	..	..	..	..	..	..	..	A	A	A	..
Carbon Tetrachloride	5% to 10% Aqueous Sol.	Room	B	AB	AB	AB	A	A	A	A	A	A	A	A	*A	A	B	C
Chlorbenzol (Pure)	Concentrated	Room	B	B	AB	AB	A	A	A	A	A	A	A	..	C	A	C	C
Copper Acetate	Saturated	Room	..	..	AB	AB	A	..	..	..	..	..	..	..	C	A	A	..
Copper Carbonate	Sat. Sol.		C	..	B	B	B	A	A	A	A	..	..	AB	C	A	A	..
Copper Chloride	1% Agitated & Aerated	Room	C	..	A	A	A	A	A	A	A	..	..	AB	A	A	A	A
Copper Chloride	5% Agitated	Room	C	..	C	C	B	A	A	A	A	C	C	C	A	A	A	A
Copper Chloride	5% Aerated	Room	C	..	C	C	C	A	A	A	A	C	C	C	*B	*A	*B	*B
Copper Cyanide	Saturated	Boiling	C	..	C	C	C	A	A	A	A	C	C	C	*C	*B	*B	*B
Copper Nitrate	1% to 5%	Room	C	..	C	C	C	A	A	A	A	C	C	C	*C	*C	*C	*C
Copper Nitrate	50% Aqueous	Room	C	..	C	C	C	A	A	A	A	C	C	C	A	A	A	A
Copper Sulphate	5%	Room	C	..	B	B	B	C	A	A	A	C	C	B	A	A	A	A
Copper Sulphate	Saturated	Boiling	C	A	B	B	B	A	A	A	A	C	C	C	A	A	A	A
Cupric Chloride		105°	C	A	BC	BC	BC	..	..	..	..	C	C	C	A	A	..	..
Cupric Nitrate			C	..	C	C	BC	C	C	A	C	C	C	C	C	A	..	C
Ethyl Acetate			C	..	C	A	C	C	C	A	C	A	..	..	A	A	..	..
Ethyl Chloride			A	A	A	A	A	C	C	A	C	A	A	A	..	..	..	..
Ethylene Chloride	5%	Room	B	..	A	A	A	A	A	A	A	..	AB	..	A	A	A	..
Ferric Chloride		Room	..	..	B	B	B	..	..	..	..	..	AB	..	A	A	..	..
Ferric Chloride	1% Still	Room	C	..	C	C	C	C	C	A	C	C	C	C	†*B	*A	*B	C
Ferric Chloride	1% Still	Boiling	C	..	C	C	C	C	C	A	C	..	..	..	C	C	C	..
Ferric Chloride	5% Still	Room	C	..	C	C	C	C	C	A	C	..	..	..	C	C	C	C
Ferric Chloride	5% Agitated	Room	C	..	C	C	C	C	C	A	C	..	..	..	C	C	C	C
Ferric Chloride	5% Aerated	Room	C	..	C	C	C	C	C	A	C	..	..	..	C	C	C	C
Ferric Hydroxide		Room	..	..	B	B	B	A	A	A	A	..	..	..	A	A	..	..
Ferric Nitrate	1% to 5%	Room	C	..	C	C	C	C	C	A	C	C	C	C	A	A	A	A
Ferric Sulphate	1% to 5%	Room	C	..	C	C	C	C	C	A	C	C	C	C	*A	A	*A	*A
Ferrous Chloride			C	..	B	B	B	A	A	A	A	C	C	C	A	A	A	A
Ferrous Sulphate	Dilute	Room	AB	..	B	B	B	A	A	A	A	C	C	C	A	A	A	A
Ferrous Ammonium Citrate			B	..	B	B	B	A	A	A	A	..	..	AB	††A	†A	†A	..
Hydrogen Peroxide		Room	A	A	B	A	A	B	B	A	B	..	..	AB	††B	†A	†B	..
Hydrogen Peroxide		Boiling	..	A	C	C	C	B	B	A	B	AB	AB	AB	A	A	†A	..
Hydrogen Sulphide	Dry		A	C	C	B	B	A	B	A	B	AB	AB	AB	A	A	†A	..
Hyposulphite Soda (Hypo)			..	..	C	B	B	..	..	..	..	..	..	..	†AB	A	BC	..
Lactic Acid Salts			AB	..	A	A	A	A	A	A	A	AB	AB	AB	A	A	..	..
Lead Acetate			BC	..	B	A	B	A	A	A	A	AB	..	..	A	A	A	..

LEGEND:

A —Fully resistant.
B —Slightly attacked.
C —Unsatisfactory
* —Subject to pitting at air line or when allowed to dry.

or to internal stresses within the material itself. Often the presence or absence of minor constituents or impurities makes a difference between that suggested and some other metal or alloy.

The John Nooter Boiler Works Company will be pleased to supply welded samples of these materials for testing under actual operating conditions.

SALTS—Continued

MEDIA	Concentration	Temperature °F	Aluminum	Illium	Copper	Silicon Bronze	Cupro-Nickel	Hastelloy A	Hastelloy B	Hastelloy C	Hastelloy D	Monel	Nickel	Inconel	Stainless Steel 302	Stainless Steel 316	Stainless Steel 430	Stainless Steel 410
Manganese Carbonate			..	..	A	A	A	..	..	..	..	..	..	..	A	A	A	A
Manganese Chloride	10% to 50% Aqueous Sol.	Boiling	..	..	BC	BC	BC	..	..	..	..	..	..	..	A	A	A	..
Magnesium Carbonate			C	..	A	A	A	A	A	A	A	AB	AB	..	A	A	A	A
Magnesium Chloride	1% to 5% Still	Room	B	..	B	B	B	A	A	A	A	AB	AB	AB	*A	A	*A	..
Magnesium Chloride	1% to 5% Still	Hot	..	..	B	B	B	A	A	A	A	AB	AB	AB	C	*B	..	..
Magnesium Hydroxide	Thick Suspension	Room	C	..	B	A	A	A	C	A	A	A	A	A	A	A	..	..
Magnesium Nitrate			A	..	B	A	B	A	C	A	A	..	..	AB	A	A	A	..
Magnesium Sulphate	5%	Hot	A	..	B	A	A	A	A	A	A	A	A	A	A	A	A	B
Methylene Chloride	40%	Room to Boiling	C	..	A	A	A	C	A	A	A	..	AB	..	A	A	A	B
Mercuric Bichloride	0.07%	Room	C	..	C	C	C	A	C	A	A	C	..	..	*A	*A	..	..
Mercuric Chloride	Dilute	Room	C	..	C	C	C	A	C	A	A	C	..	AB	C	C	C	..
Mercuric Cyanide			C	..	C	C	C	A	C	A	A	C	..	AB	A	A	..	B
Mercurous Nitrate				..	C	B	C	A	C	A	A	C	..	..	A	A	A	A
Nickel Chloride		Room	C	..	B	B	B	A	C	A	A	C	..	..	*A	*A	..	..
Nickel Nitrate	10%	Room	A	..	B	B	B	A	C	A	A	C	C	C	A	A	A	A
Nickel Sulphate	10%	Room	A	..	B	B	B	A	C	A	A	C	..	..	A	A	..	..
Nitrous Oxide	Dry		A	..	A	A	A	C	C	A	C	C	C	C	..	..	..	..
Phosphoric Anhydride	Dry	Room		..	A	A	A	..	..	..	C	..	..	..	A	A	..	..
Phosphorous Trichloride			C	..	A	A	A	C	C	A	C	..	AB	..	A	A	..	..
Potassium Bichromate	Neutral	Room	C	..	A	A	A	C	C	A	C	A	..	AB	A	A	A	A
Potassium Bromide	5%	Room	B	..	A	A	A	C	A	A	A	AB	..	..	*B	*A	..	..
Potassium Carbonate	1%	Room	RC	..	A	A	A	A	A	A	A	AB	AB	..	A	A	A	A
Potassium Chlorate			AB	..	AB	AB	AB	C	C	A	A	AB	AB	AB	A	A	A	A
Potassium Chloride	1% to 5%	Room	B	..	A	A	A	C	A	A	C	AB	AB	..	*A	*A	*A	*AB
Potassium Chloride	1% to 5%	Boiling	B	..	BC	BC	BC	C	C	A	C	AB	AB	..	*A	*A	..	..
Potassium Cyanide			C	..	C	C	C	A	C	A	A	AB	..	..	A	A	A	A
Potassium Dichromate	Neutral		A	A	A	A	A	C	C	A	A	..	..	AB	A	A	A	A
Potassium Ferricyanide	5%	Room	R	..	A	A	A	A	A	A	A	A	A	AB	*A	*A	*A	*A
Potassium Ferrocyanide	5%	Room	C	A	A	A	A	A	A	A	A	A	A	A	*A	*A	*A	*A
Potassium Hydrate			C	..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Hydroxide	5%	Room	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Hydroxide	27%	Boiling	C	A	B	B	B	A	A	A	A	A	A	A	B	A	..	..
Potassium Hydroxide	50%	Boiling	C	A	B	B	B	A	A	A	A	A	A	A	B	A	..	..
Potassium Hypochlorite			C	..	C	C	A	C	C	A	C	C	C	C	*B	*B	..	..
Potassium Iodide			B	..	A	A	A	C	C	A	C	AB	AB	..	A	A	..	..
Potassium Nitrate	5%	Room	A	..	A	A	A	C	C	A	C	AB	AB	..	A	A	A	A
Potassium Oxalate			B	..	A	A	A	C	C	A	C	..	AB	..	A	A	A	A
Potassium Permanganate	Neutral		A	A	A	A	A	C	C	A	C	..	..	AB	A	A	A	A
Potassium Sulphate	1% to 5%	Room	A	..	A	A	A	C	A	A	A	AB	..	..	A	A	A	A
Potassium Sulphate	1% to 5%	Hot	..	..	B	B	B	..	..	..	..	..	..	..	A	A	..	..
Potassium Sulphide (Salt)			..	..	C	C	C	..	..	..	..	..	..	..	A	A	..	..
Quinine Bisulphate (Dry)			..	..	A°	A°	A°	A	A	A	A	AB	..	..	B	A	B	..
Quinine Sulphate (Dry)			..	..	A°	A°	A°	A	A	A	A	AB	..	..	B	A	B	..
Silver Bromide			C	..	C	C	C	A	A	A	A	AB	..	..	*B	*A	C	..
Silver Chloride			..	..	C	C	C	A	A	A	A	..	..	..	C	C	C	..
Silver Cyanide			C	..	C	C	C	A	A	A	A	AB	..	..	A	A	A	..
Silver Nitrate			C	A	C	C	C	A	A	A	A	..	..	AB	A	A	A	A
Sodium Acetate (Moist)	5%	Room	A	..	A	A	A	A	A	A	A	AB	..	..	*A	A	*A	..
Sodium Benzoate			C	..	A	A	A	A	A	A	A	AB	..	..	A	A	..	..
Sodium Bicarbonate	All Conc.	150°	A	..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Bichromate	Neutral		A	..	C	C	B	C	C	A	C	..	..	AB	A	A	A	A
Sodium Bisulphate			BC	..	B	B	A	A	A	A	A	AB	..	..	A	A	..	..
Sodium Borate			B	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Sodium Bromide	5%	Room	B	..	A	A	A	A	A	A	A	AB	..	..	A	A	..	..
Sodium Carbonate	All Conc.	Room	C	..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Chlorate	25%		AB	..	AB	AB	AB	C	C	A	C	..	..	AB	A	A	A	A
Sodium Chloride	5% Still	Room to 150°	B	A	A	A	A	C	A	A	C	A	A	..	*A	*A	*B	*B
Sodium Chloride	20% Aerated	Room	B	A	A	A	A	A	A	A	A	A	A	..	*A	*A	..	..
Sodium Chloride	Saturated	Room	B	B	A	A	A	A	A	A	A	A	A	..	*A	*A	..	..
Sodium Chloride	Saturated	Boiling	B	A	A	A	A	A	A	A	A	A	A	..	*B	*A	..	..
Sodium Citrate			C	..	A	A	A	A	A	A	A	..	AB	AB	A	A	A	A
Sodium Ferricyanide			B	..	A	A	A	A	A	A	A	..	..	AB	*A	*A	*A	*A
Sodium Ferrocyanide			B	..	A	A	A	..	..	..	..	..	..	..	..	..	..	..
Sodium Fluoride	5%	Room	B	B	A	A	A	A	A	A	A	AB	..	..	*B	*A	C	..
Sodium Hydrosulphite			A	..	B	B	B	A	B	A	B	C	..	..	..	..	..	..
Sodium Hydroxide	10%	Room	C	A	A	A	A	A	A	A	A	C	A	C	A	*A	A	A
Sodium Hypochlorite	5%	Room	C	C	C	C	B	C	C	A	C	C	C	C	*B	*A	C	..
Sodium Hyposulphite	Dilute	Room	..	..	B	B	B	..	..	..	..	..	..	..	†‡A	A	††B	..
Sodium Lactate			C	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Sodium Nitrate	All Conc.	Room	A	A	A	A	A	C	C	A	C	AB	..	..	A	A	A	A
Sodium Nitrite			A	..	A	A	A	..	..	..	..	..	AB	..	A	A	..	..
Sodium Peroxide		212°	C	..	B	B	B	C	C	A	C	AB	..	..	A	A	..	..
Sodium Phosphate	5%	Room	C	..	A	A	A	C	A	A	C	AB	..	..	A	A	A	A
Sodium Silicate			AB	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Sodium Sulphate	5% Still	Room	A	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Sodium Sulphate	Concentrated	Room	A	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Sodium Sulphide	Saturated	Room	B	A	C	C	B	A	A	A	A	..	AB	AB	*B	A	*B	*B
Sodium Sulphite	5%	Room	A	..	B	C	B	C	C	A	C	B	..	..	A	A	A	A
Stannic Chloride	5%	Room	C	A	C	C	C	C	C	A	C	C	C	C	C	C	C	C
Stannous Chloride	5%	Room	C	..	C	C	C	A	A	A	C	C	C	C	C	C	C	C
Sulphur Chloride	Dry		C	..	A	A	A	A	A	A	A	AB	..	..	A	A	..	..
Sulphur Dioxide	Dry	Room	A	C	A	A	A	C	C	A	C	C	C	C	A	A	..	..
Sulphur Dioxide	Moist	Room	..	..	B	B	B	C	C	A	C	C	C	C	A	A	C	..
Titanium Tetrachloride			C	..	B	B	B	C	C	A	C	AB	..	..	A	..	..	..
Zinc Chloride	5% Still	Room	C	A	B	B	B	B	A	C	C	AB	..	..	*A	*A	*A	*B
Zinc Chloride	5% Still	Boiling	C	A	B	B	B	C	A	C	C	AB	..	..	*B	*B	*B	AB
Zinc Sulphate	5%	Room	AB	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	..
Zinc Sulphate	Saturated	Room	AB	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	..
Zinc Sulphate	25%	Boiling	..	..	B	B	B	C	C	A	C	..	..	..	A	A	..	..

**—Keep solutions alkaline.
††—May attack when sulphuric acid is present.
‡—May attack when hydrochloric acid is present.
°—Tin-coated.

ACIDS

MEDIA	Concentration	Temperature °F	Aluminum	Illium	Copper	Silicon Bronze	Cupro-Nickel	Hastelloy A	Hastelloy B	Hastelloy C	Hastelloy D	Monel	Nickel	Inconel	Stainless Steel 302	Stainless Steel 316	Stainless Steel 430	Stainless Steel 410
Acetic Acid	5%	Room	B	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	AB
Acetic Acid	20%	Room	B	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	C
Acetic Acid	50%	Room	B	A	A	A	A	A	A	A	A	..	..	AB	A	A	..	..
Acetic Acid	50%	Boiling	..	A	BC	BC	BC	A	A	A	A	..	..	AB	A	A	..	..
Acetic Acid	100%	Room	A	A	A	A	A	A	A	A	A	..	..	..	C	A	A	C
Acetic Anhydride		Boiling	..	A	A	A	A	A	A	A	A	..	..	AB	A	A	..	..
Acetic Anhydride		Room	A	A	A	A	A	A	A	A	A	..	..	..	A	A	A	C
Acetic Vapors		Boiling	..	A	A	A	A	A	A	A	A	..	..	AB	A	A	..	..
Arsenic Acid	100%	Hot	AB	A	B	B	B	A	A	A	A	..	..	AB	C	C	..	..
Benzoic Acid	90%	225 °	..	A	A	A	A	A	A	A	A	..	..	..	B	A	A	A
Boric Acid	5%	Room	A	A	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Butyric Acid	5%	Boiling	A	A	A	A	A	A	A	A	A	..	AB	..	A	A	A	A
Carbonic Acid		Room	A	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	A
Carbolic Acid, C. P.			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chloroacetic Acid		Room	A	A	A	A	A	B	B	B	B	AB	..	..	C	C	C	C
Chloric Acid		Room	C	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chlorosulphonic Acid		Room	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chromic Acid	10%		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chromic Acid, C. P.	5%	Room	AB	C	C	C	C	C	C	C	C	AB	..	..	C	C	C	C
Chromic Acid	10%	Boiling	..	C	C	C	C	C	C	C	C	..	..	AB	C	C	..	..
Citric Acid	50%	Boiling	..	C	C	C	C	C	C	C	C	..	..	..	C	C	..	..
Citric Acid	5% Still	150 °	A	A	A	A	A	A	A	A	A	..	..	..	A	A	C	C
Citric Acid	15%	Room	A	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	A
Citric Acid	15%	Boiling	BC	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	B
Fatty Acids	Concentrated	Boiling	BC	A	A	B	B	A	A	A	A	..	..	AB	C	C	AB	..
Formic Acid			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gallic Acid	5% Still	Room to 150°	A	A	A	A	A	A	A	A	A	..	..	AB	A	A	..	..
Hydrobromic Acid	5%	Room to Boiling	C	A	A	A	A	A	A	A	A	..	..	AB	A	A	..	..
Hydrochloric Acid		Boiling	A	A	B	B	B	A	A	A	A	..	..	AB	A	A	C	C
Hydrochloric Acid	5% Unaerated	Room	C	C	C	C	BC	A	A	A	A	C	C	C	C	C	A	C
Hydrochloric Acid	10% Unaerated	Room	C	C	C	C	BC	A	A	A	A	AB	..	..	C	C	C	C
Hydrochloric Acid	20%	Room	C	C	C	C	BC	A	A	A	A	B	B	C	C	C	C	C
Hydrochloric Acid	All	100 ° F.	C	C	C	C	C	A	A	A	A	..	..	..	C	C	C	C
Hydrochloric Acid	All	122 ° F.	C	C	C	C	C	A	A	A	A	..	..	..	C	C	C	C
Hydrochloric Acid	All	160 ° F.	C	C	C	C	C	A	A	A	A	..	..	..	C	C	C	C
Hydrochloric Acid Fumes	Concentrated	100 °	C	B	C	C	BC	A	A	A	A	..	..	..	C	C	C	C
Hydrocyanic Acid			C	A	C	C	C	A	A	A	A	AB	..	..	C	C	C	C
Hydrofluoric Acid	All	All	A	A	C	C	C	B	A	A	C	AB	..	..	C	C	C	C
Hydrofluoric Acid, Vapors	Aerated	212 °	C	AB	C	C	BC	B	A	A	C	AB	..	..	C	C	C	C
Hydrofluosilicic Acid	5%	70 °	..	AB	C	C	BC	..	A	A	C	AB	..	..	C	C	C	C
Hydrofluosilicic Acid Vapors		212 °	..	AB	C	C	BC	..	..	..	C	AB	..	..	C	C	C	C
Lactic Acid	5%	Room	AB	A	A	A	A	A	A	A	A	AB	AB	AB	A	A	A	B
Lactic Acid	5%	150 °	AB	A	A	A	A	A	A	A	A	..	..	..	A	A	B	C
Lactic Acid	10%	150 ° to Boiling	..	A	AB	AB	A	A	A	A	A	AB	..	..	A	A	B	B
Malic Acid		Cold & Hot	A	A	C	C	BC	A	A	A	A	..	..	..	A	A	B	C
Molybdic Acid	5%	Room	..	A	..	..	..	A	A	A	A	AB	..	..	A	A	C	A
Muriatic Acid		Room	C	A	C	C	BC	A	A	A	A	..	..	..	A	A	A	AB
Nitric Acid	5%	Room	BC	A	C	C	C	A	A	A	A	C	C	C	A	A	A	..
Nitric Acid	20%	Room	C	A	B	C	C	A	A	A	A	C	C	AB	A	A	A	..
Nitric Acid	50%	Room	C	A	B	C	C	A	A	A	A	C	C	C	A	A	A	..
Nitric Acid	50%	Boiling	C	A	B	C	C	A	A	A	A	C	C	C	A	A	A	..
Nitric Acid	65%	Boiling	C	A	B	C	C	A	A	A	A	C	C	C	A	A	A	..
Nitric Acid	95%	Room	C	A	A	C	C	A	A	A	A	..	..	..	A	A	A	..
Nitric Acid	Concentrated	Room	A	A	A	C	C	A	A	A	A	..	..	..	A	A	A	..
Nitric Acid	Concentrated	Boiling	C	A	A	C	C	A	A	A	A	..	..	..	A	A	A	..
Nitric Acid	Fuming	Room	C	A	A	C	C	A	A	A	A	..	..	..	A	A	A	..
Nitrous Acid	5%	Room	AB	A	A	B	B	A	A	A	A	..	..	..	A	A	A	..
Oleic Acid		Room	A	A	A	A	A	A	A	A	A	AB	AB	AB	A	A	A	..
Oxalic Acid	5%	Cold & Hot	A	A	A	A	A	A	A	A	A	AB	..	..	A	A	A	..
Oxalic Acid	10%	Room	B	A	A	A	A	A	A	A	A	AB	..	..	A	A	A	..
Oxalic Acid	10%	Boiling	C	A	A	A	A	A	A	A	A	AB	..	..	A	A	A	..
Phosphoric Acid	1%	Room	C	A	A	B	B	A	A	A	A	AB	..	..	A	A	A	..
Phosphoric Acid	5%	Room	C	A	A	B	B	A	A	A	A	AB	..	..	A	A	A	..
Phosphoric Acid	10% Still	Room	C	A	A	B	B	A	A	A	A	AB	AB	AB	A	A	A	..
Phosphoric Acid	10% Agitated	Room	C	A	A	B	B	A	A	A	A	AB	..	..	A	A	A	..
Phosphoric Acid	10% Aerated	Room	C	A	A	B	B	A	A	A	A	AB	..	..	A	A	A	..
Picric Acid	Concentrated	Room	A	A	A	C	C	A	A	A	A	..	..	..	A	A	A	..
Pyrogallic Acid			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salicylic Acid			..	A	A	A	A	A	A	A	A	AB	AB	AB	A	A	A	..
Stearic Acid	Concentrated	200 °	A	A	A	A	A	A	A	A	A	AB	AB	AB	A	A	A	..
Succinic Acid		Molten	A	A	A	A	A	A	A	A	A	AB	..	AB	A	A	A	..
Sulphuric Acid	5%	Room	BC	A	BC	BC	BC	B	B	B	B	AB	..	..	C	C	C	..
Sulphuric Acid	5%	Boiling	C	A	BC	BC	BC	C	C	C	C	C	C	C	C	C	C	..
Sulphuric Acid	10%	Room	B	A	BC	BC	BC	C	C	C	C	C	C	C	C	C	C	..
Sulphuric Acid	10%	Boiling	C	A	BC	BC	BC	C	C	C	C	C	C	C	C	C	C	..
Sulphuric Acid	50%	Room	C	A	C	C	C	C	C	C	C	C	C	C	C	C	C	..
Sulphuric Acid	50%	Boiling	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	..
Sulphuric Acid	Concentrated	Room	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	..
Sulphuric Acid	Concentrated	Boiling	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	..
Sulphuric Acid	Concentrated	300 °	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	..
Sulphuric Anhydride	Fuming	Room	C	A	C	C	C	A	A	A	A	C	C	C	C	C	C	..
Sulphurous Acid	Dry		A	A	B	B	B	A	A	A	A	C	C	C	C	C	C	..
Sulphurous Spray	Saturated	375 °	B	A	B	B	B	A	A	A	A	C	C	C	C	C	C	..
Tannic Acid		Room	..	A	A	A	A	A	A	A	A	C	C	C	C	C	C	..
Tannic Acid	10%	Room	A	A	A	A	A	A	A	A	A	C	C	C	C	C	C	..
Tartaric Acid		150 °	..	A	A	A	A	A	A	A	A	AB	..	..	C	C	C	B
Tartaric Acid	10%	Room	A	A	A	A	A	A	A	A	A	..	..	..	A	A	A	B
Trichloroacetic Acid		150 °	..	A	A	A	A	A	A	A	A	..	..	..	B	B	C	C
Uric Acid		Room	C	..	B	B	B	A	A	A	A	..	..	..	C	C	C	C
		Conc.	..	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	A

LEGEND:

A —Fully resistant.
B —Slightly attacked.
C —Unsatisfactory
* —Subject to pitting at air line or when allowed to dry.

**—Keep solutions alkaline.
††—May attack when sulphuric acid is present.
† —May attack when hydrochloric acid is present.
° —Tin-coated.

MISCELLANEOUS

MEDIA	Concentration	Temperature °F	Aluminum	Illium	Copper	Silicon Bronze	Copper Nickel Alloy	Hastelloy A	Hastelloy B	Hastelloy C	Hastelloy D	Monel	Nickel	Inconel	Stainless Steel 302	Stainless Steel 316	Stainless Steel 430	Stainless Steel 410
Acetone		Boiling	A	..	A	A	A	A	A	A	A	A	A	A	A	B	B	B
Alcohol—Methyl,Propyl,Butyl,Ethyl		Room	A	..	A	A	A	A	A	A	A	A	A	A	A	A	C	A
Alkaform			..	..	..	..	..	A	A	A	A	..	..	..	A	C	C	C
Aluminum		Molten	C	..	C	C	C	A	A	A	A	C	C	C	C	C	C	C
Aniline	Conc.	Room	C	..	A	A	A	A	A	A	A	..	AB	..	A	A	A	..
Baking Oven Gases			A	..	A	A	A	A	A	A	A	..	..	AB	A	A	A	A
Beer			A	..	A	A	A	A	A	A	A	..	AB	..	A	A	A	AB
Benzene		Room	A	..	A	A	A	A	A	A	A	AB	AB	..	A	A	A	..
Benzol		Hot	A	..	A	A	A	A	A	A	A	C	..	..	A	A	A	B
Bleaching Powder	Solution	Hot	C	..	B	B	A	B	A	A	A	C	C	C	BC	AB	..	..
Blood (Meat Juices)		Cold	A	..	A	A	A	A	A	A	A	A	..	..	*A	A	A	..
Borax		Fused	B	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Bromine	Dry		C	A	C	C	C	C	C	A	C	C	C	C	C	C	C	C
Bromine Water		Room	C	C	C	A	C	A	A	A	C	C	C	A	C	C	C	..
Buttermilk		Room	A	..	A	A	A	A	A	A	A	..	AB	A	A	A	A	B
Camphor			A	..	A	A	A	A	A	A	A	..	AB	..	A	A	A	A
Carbonated Beverages			AC	..	A	A	A	A	A	A	A	..	..	AB	A	A	A	A
Carbon Monoxide Gas		1598°	..	..	A	A	A	A	A	A	A	AB	AB	AB	A	A	A	..
Cadmium		Molten	C	..	C	C	C	A	A	A	A	A	A	C	A	A	..	..
Caustic Lime			C	..	A	A	A	A	A	A	A	A	A	A	A	A	..	..
Caustic Soda			C	..	AB	AB	A	A	A	A	A	A	A	A	A	A	A	AB
Chlorinated Water	Saturated	Room	AC	..	A	A	A	A	A	A	A	C	C	A	C	*B	C	..
Chlorine Gas—Dry		Room	C	A	C	C	C	C	C	A	C	A	A	A	C	C	C	..
Chlorine Gas—Moist		Room	C	C	C	C	C	C	C	C	C	..	..	..	C	C	C	..
Chlorine Gas—Moist		212°	C	..	C	C	C	C	C	C	C	C	C	C	C	C	C	..
Chloroform		Room	B	..	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Chromium Plating Bath		Room	..	A	C	C	C	..	..	..	..	..	..	..	AB	AB	..	..
Cider		Room	B	..	A	A	A	A	A	A	A	A	A	A	A	A	A	AB
Coffee		Boiling	A	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	AB
Copal Varnish			A	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	AB
Cream of Tartar			A	..	A	A	A	..	..	..	..	..	..	..	A	A	..	..
Creosote (Coal Tar)		Hot	AB	..	A	A	A	..	..	..	..	..	..	..	*A	A	..	..
Crude Oil			A	..	AC	AB	AB	A	A	A	A	AB	..	..	††A	††A	††A	..
Developing Solutions		Room	..	..	A	A	A	..	..	..	..	..	..	A	*A	*A	*A	..
Distillery Wort			A	..	A	A	A	..	..	..	..	..	..	..	A	A	..	..
Dyewood, Liquor		Room	..	..	..	..	..	..	..	..	..	..	..	..	††A	A	..	..
Ether		Room	A	..	A	A	A	A	A	A	A	..	AB	..	A	A	A	A
Flue Gases			B	..	BC	BC	BC	B	B	A	B	..	..	AB	..	AB	..	..
Fluorine		Room	C	..	C	C	C	..	..	..	..	A	..	..	C	C	C	C
Food Pastes			A	..	A	A	A	A	A	A	A	..	AB	AB	A	A	A	AB
Formaldehyde		Room	B	..	A	A	A	A	A	A	A	..	..	AB	*A	*A	*A	..
Fuel Oil		Hot	A	..	AB	A	A	A	A	A	A	AB	..	..	A	A	..	..
Fuel Oil (Containing H_2SO_4)		Hot	BC	..	AB	AB	AB	A	A	A	A	B	..	..	C	B	..	..
Fruit Juices		Room	B	A	A	A	A	A	A	A	A	..	..	A	A	A	A	AB
Furfural			A	..	A	A	A	A	A	A	A	AB	..	..	A	A	..	..
Gasoline			A	A	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Glauber's Salt	Solution	Hot	A	A	A	A	A	A	A	A	A	AB	..	..	A	A	..	..
Glue—Dry		Room	A	..	A	A	A	A	A	A	A	..	AB	..	A	A	A	..
Glue—Solution Acid		Hot	..	..	AB	AB	AB	A	A	A	A	..	..	..	*B	A	..	..
Glycerine		Room	A	..	A	A	A	A	A	A	A	..	AB	..	A	A	A	A
Gypsum			..	..	A	A	A	..	..	..	..	..	..	..	A	A	..	..
Hydrocarbons			A	..	A	A	A	A	A	A	A	AB	..	..	..	..	..	..
Ink			AC	..	A	A	A	A	A	A	A	..	..	AB	††B	A	..	..
Iodine			C	C	AC	AC	AC	C	C	A	C	C	C	B	C	C	C	C
Iodoform			A	..	..	..	..	..	..	..	..	..	..	..	C	A	..	..
Kerosene		Room	A	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	..
Ketchup		Room	C	..	A	A	A	A	A	A	A	AB	..	..	*A	A	*A	*A
Lard		Room	A	..	A	A	A	A	A	A	A	..	..	..	A	A	A	..
Lead		Molten	A	..	C	C	A	A	A	A	A	C	C	C	C	C	C	C
Linseed Oil			A	..	AB	AB	AB	A	A	A	A	AB	AB	A	A	A	A	A
Lye (Caustic)	34%	230°	C	A	AB	AB	A	A	A	A	A	A	A	A	A	A	BC	C
Lysol		212°	AC	..	AB	AB	A	A	A	A	A	A	A	..	*A	*A	..	..
Mayonnaise		Cold & Hot	BC	..	A	A	A	A	A	A	A	AB	..	AB	*A	A	..	..
Meats (Unsalted)		Room	A	..	A	A	A	A	A	A	A	..	AB	..	*A	A	*A	AB
Mash		Hot	A	..	A	A	A	A	A	A	A	..	..	..	A	A	..	..
Mercury			C	A	C	C	A	A	A	A	A	AB	AB	A	A	A	A	A
Milk—Fresh or Sour		Hot or Cold	A	..	A	A	A	A	A	A	A	..	AB	A	A	A	A	B
Mine Water—Acid			B	A	B	B	AB	A	A	A	A	C	C	C	*A	*A	..	..
Molasses			A	..	A	A	A	A	A	A	A	A	A	A	A	A	A	..
Mustard		Room	C	..	A	A	A	A	A	A	A	AB	..	..	*A	*A	C	..
Naphtha			A	..	A	A	A	A	A	A	A	..	AB	..	A	A	A	A
Nitre Cake		Fused	..	A	..	..	..	..	..	..	..	..	..	..	B	A	B	..
Oils—Crude		Hot & Cold	A	..	AC	AB	AB	A	A	A	A	AB	..	..	††A	††A	††A	††A
Oils—Mineral—Vegetable		Hot & Cold	A	..	AB	AB	AB	A	A	A	A	AB	AB	..	††A	A	††A	††A
Paraffin		Molten	A	..	A	A	A	A	A	A	A	AB	..	..	A	A	A	A
Paregoric Compound			..	..	A	A	A	A	A	A	A	..	..	..	A	A	B	B
Petroleum Ether			A	..	A	A	A	A	A	A	A	..	..	..	A	A	A	A
Phenol			A	..	A	A	A	A	A	A	A	..	A	..	*A	*A	*A	*A
Phenolic Resins			A	..	A	A	A	A	A	A	A	..	A	..	A	A	..	..
Pine Tar Oil			A	..	A	A	A	A	A	A	A	AB	..	..	A	A	..	..
Potash	Solution	Hot	C	..	A	A	A	A	A	A	A	A	A	A	A	A	..	..
Rosin		Molten	A	..	A	A	A	A	A	A	A	..	..	AB	A	A	B	B
Sal Ammoniac	20%	Boiling	C	A	C	A	A	A	A	A	A	AB	..	..	B	B	..	..
Salt	Saturated	Room	B	B	A	A	A	A	A	A	A	A	A	..	*B	*A	C	..
Salt Brine	Saturated	Hot	B	..	AC	AB	A	A	A	A	A	AB	AB	..	*A	*A	..	..
Sea Water			B	A	AC	AB	A	A	A	A	A	A	..	..	*A	*A	C	..
Sewage			AB	..	B	B	B	..	..	..	..	..	..	..	††A	††A	..	..
Soaps		Room	BC	..	AB	AB	AB	A	A	A	A	..	AB	..	A	A	A	A
Soy Bean Oil			A	..	A	A	A	A	A	A	A	AB	..	..	A	A	..	..
Soda Pulp			..	..	..	..	..	A	A	A	A	A	A	A	..	..	..	..
Starch	Solution		..	..	A	A	A	..	..	..	..	..	..	..	A	A	..	..
Steam			..	..	B	C	B	..	..	..	..	A	A	A	A	A	A	AB
Sugar Juice			A	..	A	A	A	A	A	A	A	..	..	..	A	A	A	..
Sulphur—Dry		Molten	A	A	C	C	B	A	A	A	A	C	C	C	A	A	..	..
Sulphur—Wet			..	..	B	B	B	..	..	..	..	C	C	C	*B	*A	*B	..
Tin		Molten	C	..	C	C	A	A	A	A	A	C	C	C	C	C	C	..
Tomato Juice		Room	B	A	A	A	A	A	A	A	A	..	AB	..	*A	*A	..	..
Turpentine Oil			A	..	A	A	A	A	A	A	A	..	..	..	A	A	..	..
Tung Oil			A	..	A	A	A	A	A	A	A	..	AB	..	A	A	..	..
Varnish			A	..	A	A	A	A	A	A	A	..	..	..	A	A	A	A
Vegetable Juices			AB	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	AB
Vinegar—Still		Room	BC	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	B
Vinegar—Agitated		Room	BC	A	A	A	A	A	A	A	A	..	..	AB	A	A	A	B
Vinegar—Aerated		Room	BC	A	AB	AB	AB	A	A	A	A	..	..	AB	A	A	A	B
Vinegar—Fumes			C	..	AB	AB	AB	A	A	A	A	..	..	AB	B	A	B	..
Vinegar and Salt			C	A	B	B	B	A	A	A	A	..	..	AB	..	..	..	..
Water			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water—Hot			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water—Salt			B	A	AC	AB	A	A	A	A	A	..	AB	..	*A	*A	A	C
Water—Sea			..	A	AC	AB	A	A	A	A	A	A	..	..	*A	*A	C	C
Whiskey			..	A	A	A	A	..	..	..	..	A	A	A	A	A	..	..
Zinc		Molten	C	..	C	C	C	..	..	..	..	C	C	C	C	C	C	..

TO NOOTER

Your Job is an Individual Assignment!

Everything Nooter has learned in half a century of plate fabrication is aimed at completing your construction job, promptly, economically and so that it will meet the most exacting demands.

Because requirements for the fabrication of steel, alloy, and pure-metal equipment are as diverse as American industries, we maintain a custom shop. Everything we build is made for a specific purpose . . . and everything we know is devoted to seeing that this purpose is fulfilled.

Nooter was among the first shops in the country to become engaged in the fabrication of alloys and pure metals by the electric-welding process. With the advent of coated electrodes, our plant began devoting its facilities to the future of electric welding. Thus we literally grew up with the industry.

Research and experience in the field of welding led to the evolution of practical procedures governing the working of various metals. These rigidly controlled procedures, enforced from the drafting board to the test stand, assure you of quality, strength, and fine workmanship.

Our modern daylight plant is completely equipped with welding positioners, overhead cranes, automatic turning rolls, the latest in flame-cutting and machining devices. The shops are manned by a loyal group of mechanics highly skilled in the use of the shielded arc, carbon arc, atomic hydrogen, oxy-acetylene and automatic methods of welding. These mechanics have been an integral part of the Nooter organization and are proud of the reputation for quality workmanship they have developed.

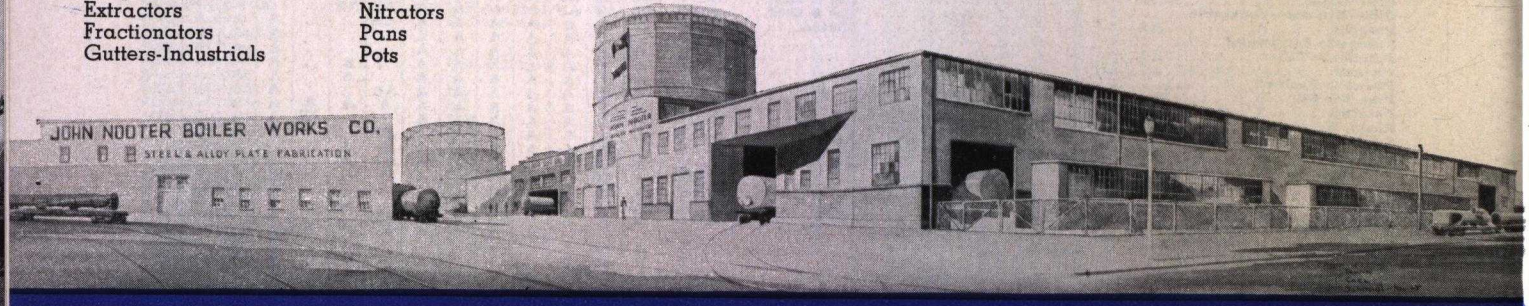
Nooter's completely equipped plant, central location, rigid control of fabrication methods—all combine to assure you of superior service and quality.

Yes—your job is an individual assignment at Nooter's . . . and the result is equipment "tailor made" to your requirements.

DIVERSIFIED FABRICATIONS - - IN THESE MATERIALS

Agitator Tanks
Alloy Equipment
Breechings
Chutes
Columns
Condensers
Coolers
Distillation Equipment
Dryers
Ducts
Evaporators
Extractors
Fractionators
Gutters-Industrials
Heat Exchangers
Heaters
Hoods
Hoppers
Jacketed Tanks (Vessels)
Kettles
Ladles
Lead Lined Tanks
Melters
Milk Storage Tanks
Mixers
Nitrators
Pans
Pots
Pressure Vessels
Retorts
Stacks
Steam Boxes
Steam Pans
Tanks
Towers
Troughs
Vacuum Pans
Vats

Aluminum
Chrome Steel
Copper
Cupro-Nickel
Hastelloy (Nickel-Base Alloys)
Illium
Inconel
Inconel-Clad Steel
Lead
Monel Metal
Monel Metal-Clad Steel
Nickel
Nickel-Clad Steel
Silicon Bronze
Silver
Silver-Clad Steel
Stainless-Steel
Stainless-Clad Steel
Steel



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